

Marked Up Version Of The Pending Claims under 37 C.F.R. 1.121(c)(1)(ii):

In accordance with 37 C.F.R. 1.121(c), by which the Applicant submits the following marked up version:

1. (currently amended) A system for enabling a user to create on a computer workstation a visually displayed architectural description of a computer simulation of a real system comprising:
 - a. a standardized set of graphical node elements representing each of a plurality of pre-defined real system components, the real system components including processes and real system hardware associated with the real system, wherein the real system components represented by the standardized set of node elements include external hardware devices, periodic processes, aperiodic processes, and continuous processes;
 - b. a standardized set of graphical arc elements representing each of a plurality of pre-defined timing, control, and data relationships that can be associated with the pre-defined real system components[[:]]
 - c. wherein each of the graphical node elements and arc elements displayed at a graphical user interface on the workstation and selectable by the user whereby the user can position selected node elements in a user-defined arrangement and connect two or more of the selected node elements with one or more selected arc elements to create on the workstation the architectural description of the simulation of the real system;

1 [[d]]c. a parameter data input window associated with at least some of the
2 selected node and arc elements, the parameter data input window
3 allowing the user to link parameter data with the selected node and
4 arc elements; and

5 [[e]]d. a plurality of simulation architecture data files describing the
6 selected node and arc elements, the user defined arrangement of the
7 node and arc elements, and the parameter data input by the user.

8 2. (previously cancelled)

9 3. (currently amended) The system of claim [[3]]1 wherein the standardized
10 set of node elements further includes at least one simulation container
11 representing in a single graphical node element a plurality of the real
12 system components.

13 4. (original) The system of claim 3 wherein the standardized set of node
14 elements further includes a boundary node.

15 5. (previously amended) A system for enabling a user to create on a computer
16 workstation a visually displayed architectural description of a computer
17 simulation of a real system comprising:

18 a. a standardized set graphical node elements presenting each of a
19 plurality of pre-defined real system components, the real system
20 components including processes and real system hardware
21 associated with the real system;

22 b. a standardized set of graphical arc elements representing each of a
23 plurality of pre-defined timing, control, and data relationships that
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1 can be associated with the pre-defined real system components
2 wherein the pre-defined timing, control, and data relationships
3 represented by the standardized set of graphical arc elements include
4 data transfer between processes, synchronization between processes,
5 and synchronization with data transfer between processes[[];

6 c.]], wherein each of the graphical node elements and arc elements
7 displayed at a graphical user interface on the workstation and
8 selectable by the user whereby the user can position selected node
9 elements in a user-defined arrangement and connect two or more of
10 the selected node elements with one or more selected arc elements to
11 create on the workstation the architectural description of the
12 simulation of the real system;

13 c[[d]]. a parameter data input window associated with at least some of the
14 selected node and arc elements, the parameter data input window
15 allowing the user to link parameter data with the selected node and
16 arc elements; and

17 d[[e]]. simulation architecture data files describing the selected node and
18 arc elements, the user defined arrangement of the node and arc
19 elements, and the parameter data input by the user.
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22 6. (original) The system of claim 5 wherein the standardized set of graphical
23 arc elements further includes a communications container representing in a
24 single graphical arc element a plurality of the timing, control, and data
25 relationships.

- 1 7. (original) The system of claim 5 wherein the synchronization relationship
2 represented by one of the arc elements defines a synchronization
3 mechanism between a first node element representing a source process and
4 a second node element representing a destination process, and the
5 parameter data that can be linked to the arc elements representing a
6 synchronization mechanism includes a sync release time relative to an
7 execution time of the source process and a sync frequency.
- 8 8. (original) The system of claim 7 wherein the source and destination
9 processes connected by an arc element representing a synchronization
10 mechanism can each be periodic, aperiodic, or continuous.
- 11 9. (original) The system of claim 8 wherein the synchronization mechanisms
12 associated with an arc element selected by the user are tested for selection
13 of an illegal synchronization relationship between node elements selected
14 by the user.
- 15 10. (original) The system of claim 9 wherein the illegal synchronization
16 relationships tested by the system include:
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18 a. connecting a periodic source process to a periodic destination
19 process with an arc element representing an aperiodic
20 synchronization mechanism;
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22 b. connecting an aperiodic source process to a periodic destination
23 process with an arc element representing a synchronization
24 mechanism; and
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1 c. connecting to a single process with multiple arc elements defining
2 different synchronization mechanisms.

3 11. (original) The system of claim 1 further comprising an output file generator
4 operable to select and organize pre-defined portions of the simulation
5 architecture data files into an electronic output file that can be used for
6 generating computer code defining a computer simulation corresponding to
7 the architectural description created by the user on the workstation.

8 12. (previously amended) A method of creating on a computer workstation a
9 graphical description of the architecture of a simulation of a real world
10 system, the method comprising the steps of:

11 a. selecting at a graphical user interface one or more graphical node
12 elements from a standardized set of graphical node elements
13 displayed on the workstation, the selected node elements
14 representing pre-defined real system components, including
15 processes and real system hardware, associated with the real system,
16 wherein the real system components represented by the standardized
17 set of node elements include external hardware devices periodic
18 processes, aperiodic processes and continuous processes;

19 b. selecting at the graphical user interface one or more graphical arc
20 elements from a standardized set of graphical arc elements displayed
21 on the workstation, the selected arc elements representing pre-
22 defined timing, control, and data relationships between the selected
23 node elements;
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- c. arranging on the graphical user interface the selected node elements and connecting the selected node elements with the selected arc elements to create and display on the workstation the architectural description of the simulation of the real system;
 - d. entering at one or more parameter data input windows associated with at least some of the selected node and arc elements parameter data that further defines properties of the selected node and arc elements found in the real world system; and
 - e. saving, in one or more simulation architecture data files, data about the selected node and arc elements, data about the user defined arrangement of the node and arc elements, and the parameter data input by the user.
13. (original) The method of claim 12 further comprising the step of generating an output file containing selected portions of the simulation architecture data files.
 14. (cancelled)
 15. (previously amended) The method of claim 13 wherein the standardized set of node elements further includes at least one simulation container representing in a single node element a plurality of the real system components.
 16. (original) The method of claim 15 wherein the standardized set of node elements further includes a boundary node.

17. (currently amended) A method of creating on a computer workstation a graphical description of the architecture of a simulation of a real world system, the method comprising the steps of:
- a. selecting at a graphical user interface one or more graphical node elements from a standardized set of graphical node elements displayed on the workstation, the selected node elements representing pre-defined real system components, including processes and real system hardware, associated with the real system;
 - b. selecting at the graphical user interface one or more graphical arc elements from a standardized set of graphical arc elements displayed on the workstation, the selected arc elements representing pre-defined timing, control, and data relationships between the selected node elements herein the pre-defined timing, control, and data relationships represented by the standardized set of arc elements include data transfer between processes, synchronization between processes, and synchronization with data transfer between processes
 - c. arranging on the graphical user interface the selected node elements and connecting the selected node elements with, the selected arc elements to create and display on the workstation the architectural description of the simulation of the real system;
 - d. entering at one or more parameter data input windows associated with at least some of the selected node and arc elements parameter data that further defines properties of the selected node and arc elements found in the real world system: and

e. saving, in one or more simulation architecture data files, data about the selected node and arc elements, data about the user defined arrangement of the node and arc elements, and the parameter data input by the user.

18. (original) The method of claim 17 wherein the standardized set of arc elements further includes a communications container representing in a single arc element a plurality of the timing, control, and data relationships.

19. (original) The method of claim 17 wherein the synchronization relationship represented by one of the arc elements defines a synchronization mechanism between a first node element representing a source process and a second node element representing a destination process, and the parameter data that can be linked to the arc elements representing a synchronization mechanism includes a sync release time relative to an execution time of the source process and a sync frequency.

20. (original) The method of claim 19 wherein the source and destination processes connected by an arc element representing a synchronization mechanism can each be periodic, aperiodic, or continuous.

21. (original) The method of claim 20 further comprising automatically testing the synchronization mechanisms associated with selected arc elements for use of an illegal synchronization relationship between selected node elements.

22. (original) The method of claim 21 wherein the illegal synchronization relationships tested further comprise include:

- a. connecting a periodic source process to a periodic destination process with an arc element representing an aperiodic synchronization mechanism;
 - b. connecting an aperiodic source process to a periodic destination process with an arc element representing a synchronization mechanism; and
 - c. connecting to a single process with multiple arc elements defining different synchronization mechanisms.
23. (original) The method of claim 13 further comprising organizing data in the output file for use in generating computer code defining a computer simulation corresponding to the architectural description created by the user on the workstation.
24. (previously amended) A system for creating a graphical representation of the architecture of a computer simulation of a real world system comprising:
- a. a computer workstation having a processor, display, keyboard, an operating system causing the processor to generate a cursor on the display, a pointing device for manipulating the cursor on the display, and a data storage device;
 - b. a first software module operable to generate a graphical user interface on the display;
 - c. a second software module operable to display on the graphical user interface a pre-defined set of graphical node elements, the node

1 elements representing pre-defined real system components, the real
2 system components including processes and real system hardware
3 associated with the real system, wherein the real system components
4 represented by the standardized set of node elements include
5 external hardware devices, periodic processes, a periodic processes,
6 and continuous processes;

7 d. a third software module operable to display on the graphical user
8 interface a pre-defined set of graphical arc elements, the arc
9 elements representing pre-defined timing, control, and data
10 relationships that can be associated with the real system components,
11 wherein the pre-defined timing, control, and data relationships
12 represented by the standardized set of a elements include data
13 transfer between processes, synchronization between processes, and
14 synchronization with data transfer between processes;

15 e. the second software module further operable to allow the user, using
16 the pointing device, to select one or more of the node elements and
17 position the selected node elements in a user-defined arrangement on
18 the display corresponding to the simulation architecture;

19 f. the third software module further operable to allow the user, using
20 the pointing device, to select one or more of the arc elements and
21 position the selected arc elements on the display to connect the
22 selected and positioned node elements so as to associate one of the
23 pre-defined timing, control, and data relationships with the node
24 elements connected by the selected are elements;
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1 g. a fourth software module operable, in conjunction with the graphical
2 user interface, to open parameter data input windows linked to one
3 or more of the selected node and arc elements and receive from the
4 user parameter data further defining properties of the linked node
5 and arc elements; and

6 h. the operating system farther operable to store on the data storage
7 device simulation architecture data files containing data
8 representing:

9 the selected node and arc elements,

10 the arrangement of the selected node elements,

11 the connection of the selected node elements by the selected arc
12 elements, and
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14 the parameter data input by the user.

15 25. (original) The system of claim 24 further comprising an output file
16 generator module operable to select and organize pre-defined portions of
17 the simulation architecture data files into an electronic output file that can
18 be used for generating computer code that defines a computer simulation
19 corresponding to the architectural description created by the user on the
20 workstation.
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